minor and major examinations he occupied several positions on the staff, and carried out research on the alkaloids of aconite. While acting afterwards for five years with the firm of Messrs. Brady and Martin at Newcastle, he successfully used his leisure to prepare for the B.Sc. degree of London University. The next six years were spent as head of the analytical department of Messrs. Burroughs Wellcome and Co. In 1905 he went into partnership in a school of pharmacy, but finally took up the independent practice of consulting and analytical chemistry. He was an eminent specialist in the analysis of drugs and medicinal substances, and as analyst to the British Medical Association made nearly all the analyses of proprietary articles which were revealed in the two publications "Secret Remedies" and "More Secret Remedies," a service of immense value to public health and public economy that has scarcely yet, for well-known discreditable reasons, been given a chance of realisation.

Col. Harrison was a fellow of the Institute of Chemistry, and published a number of papers on his special province of the science. His process for estimating the diastatic strength of malts is now in general use. He was active both as a student and a past student in the life of the Pharmaceutical Society's School, in which he was most highly regarded, and to which as his *alma mater* he was loyally devoted. He was a member of the board of examiners, and last year he delivered a thoughtful and valuable address at the inauguration of the session. For three years he conducted the practical chemistry competition maintained in the weekly *Pharmaceutical Journal*. His professional life was, indeed, in the highest degree strenuous.

As soon as the war broke out Col. Harrison was impatient to join the forces. After being refused several times on the ground of age, he became a special constable and a volunteer in the Inns of Court Reserve Corps. Later he succeeded in entering as a private in the Sportsmen's Battalion of the Royal Fusiliers. It was by an accident that he came under the notice of the first head of the anti-gas service at home, Col. Sir W. H. Horrocks, R.A.M.C., who with some difficulty succeeded in securing his services. He was given the rank of lieutenant on the general list, and from that time devoted himself to the anti-gas service. It was only in the present year that his duties were extended over both branches of the gas service. Of Col. Harrison's personal contribution to the invention, design, and manufacture of the appliances necessitated by gas warfare it would not be proper to speak at present in any detail. It is to be hoped that some day the story may be told. It is enough to say that his services were of inestimable value.

The type of chemical training and of experience which Col. Harrison brought to bear was of great value in the design of appliances, on the problem of securing and testing supplies, and of translating laboratory experiment into large-scale operations. This is well brought out in the following extract from a letter which has been received from Lord Moulton: "It is only those who were brought into intimate contact with his work who are able to estimate rightly how great a loss to the country was his death. He was an extraordinary compound of the theoretical and the practical mind. His knowledge of all that bore upon chemical warfare was extensive and profound, but it was accompanied by an overriding practical sense—a sense of proportion—which gave him quick and sound decision and enabled him to give to our armies in the field the full benefit of the researches made by us and our Allies promptly and in the most useful form. I do not see how his place can be filled. I hope, however, that events will show that he lived long enough to finish the work before him. He died at the moment of victory. I fear that his death was due to his having exhausted his strength in his devotion to his country."

Col. Harrison's talent for organisation was, however, dominant above everything. The amount of work he got through was amazing. He was in no way tempestuous or violently masterful, but with indomitable will, intense concentration, and few words he went straight to the heart of things—one thing after another—without confusion, clear-headed, terse, lucid, and suggestive, even when most weary and worn by incessant toil. He was invariably patient and imperturbable; no problem, however suddenly presented or however vast, daunted him, no mischance dismayed him. Emergency seemed to be his natural element; he seemed constantly on active duty. The mention of rest, leisure, or leave raised a smile, as for something incompatible or, perhaps, for the pleasant thought of bygone days.

One could not but wonder what this man might not have done in the arts of peace if only he had been discovered earlier. The war brought him his chance. Suddenly the bonds of an artificial world were released; he put on his armour and fought for four strenuous years, to die an acknowledged leader of men in a vast campaign, and worthy indeed of the full military honours and of the sorrow eloquent on the faces of troops of friends, amid which he was laid to rest.

A. S.

NOTES.

INASMUCH as it provides for the bringing together, under one Minister, of the Local Government Board, the Insurance Commissioners, and other bodies performing health duties of a more or less definitely preventive kind, the Ministry of Health Bill will be welcomed by all interested in improving the national health. The welcome, in all probability, will be a little less warm than it might have been, because, though the Bill may, as Dr. Addison, the introducer, said, "represent a common measure of agreement," it nevertheless contains evidence that much in the way of compromise was necessary before agreement was reached. One of the chief signs is the provision with regard to the taking over from the Board of Education of the medical inspection and treatment of school children. This, it is stated, is to come under the Ministry of Health and its Minister only "as and when it is desirable." There is probably no more important piece of health work than this in the whole realm of public health; no more important duty for a Minister of Health who desires to lay a sound foundation for an A1 nation; and many will consider it a misfortune that the new Ministry is to be formed only on condition that the Board of Education is allowed to continue to carry on health functions, in addition to those which it is regarded as being particularly fitted to perform. Because of this separation of work on behalf of children from that done for other sections of the population there will still be overlapping; the hands of the Health Minister will be, to an extent, tied, and there will be unnecessary expenditure of energy and public funds. Another provision in the Bill likely to interfere with the feelings of satisfaction experienced in certain circles is that relating to the formation of "consultative or advisory councils." To a strong Minister they need not prove a source of weakness; may, indeed, be a source of inspiration and strength; and if Sir Auckland Geddes, who has taken over the Presidency of the Local Government Board, becomes the first Minister of the first Ministry of Health, it is certain that there will be at least a strong Minister. More than this, however, there will be a capable Minister, and one who, on account of his medical and administrative training and experience, can quickly grasp the needs of the health situation and himself assist in the solution of the many problems that fall to be dealt with. With him at the head it seems unlikely that the powers of taking over the health functions of the Board of Education will long remain in abeyance, or that the "consultative councils" will have many opportunities, even if they desire to take them, of going over the head of the Ministry.

INFLUENZA in London has caused 4165 deaths during the four weeks ending November 2, the Registrar-General's returns for the several weeks giving the deaths directly attributable to the complaint as 80, 371, 1256, and 2458. Of these 48 per cent. have occurred between the ages twenty and forty-five, whilst below forty-five years the deaths have been 80 per cent. of the total, and above forty-five years only 20 per cent. Comparing the deaths from influenza at the several ages with the deaths from all causes at the corresponding ages, between the ages 0–5 years the percentage of influenza deaths is 34; 5–20 years, 63; 20–45 years, 64; 45–65 years, 32; 65–75 years, 17; and above 75 years, 8 only. In the corresponding four weeks the deaths are for pneumonia 1127, and for bronchitis 481; the percentage of deaths on those from all causes being for influenza 43, pneumonia 12, bronchitis 5. There has been no influenza epidemic half so severe in London during the last seventy-four years—since 1845 at least. Since 1845 there have only been three influenza epidemics with more than 2000 deaths. These are 1891, April 26 to July 18, with 2056 deaths; 1891–92, December 27 to March 26, with 2101 deaths; and 1899–1900, December 3 to May 12, with 2050 deaths. The deaths in London from influenza during the present epidemic are almost as numerous as the total deaths in London from the complaint in the forty-six years from 1845 to 1890, the deaths during that whole period being 4690. In ten epidemics from 1909 to 1917 the total deaths in London were 4329, which shows the exceptional virulence of the present attack.

THE leading resolution adopted by the Inter-Allied Conference on International Scientific Organisations held in London on October 9–11 last (see NATURE for October 17, p. 133) was to the effect that it is desirable that the nations at war with the Central Powers should withdraw from the existing conventions relating to international scientific associations as soon as circumstances permit, and that new associations be established by the nations at war with the Central Powers, with the eventual co-operation of neutral countries. The application of this resolution was left to the consideration of a committee of inquiry which will meet in Paris shortly. Among the subjects referred to the committee of inquiry is the organisation of the publication of bibliographical works in all branches of science. It is felt that the scientific world has hitherto relied too much upon "Centralblätter" and "Jahresberichte" for information upon recent additions to knowledge. These publications quite naturally give undue prominence to work done in Germany, while work published in other countries is not infrequently ignored. It is therefore important that complete abstracts and bibliographies of science should be published in the Allied countries, without regard to any similar works that may be appearing in Germany. It cannot, however, be expected that the income to be derived from the sale of these works of reference will defray the cost of preparation and publication, and it would therefore appear that such work would require Government subsidies. In planning new work the committee should not overlook existing undertakings, such as the International Catalogue of Scientific Literature. It ought to be possible to arrange that work of this magnitude should be continued without a break even though Germany and Austria no longer co-operate in its production.

THE first general meeting of the National Union of Scientific Workers was held on October 27, and was attended by representatives of eleven branches with more than five hundred members. The constitution of the union was determined, subject to slight alterations in redrafting the rules. It was agreed upon by the meeting that the objects of the union should include:—(1) To advance the interests of science—pure and applied—as an essential element in the national life; (2) to regulate the conditions of employment of persons with adequate scientific training and knowledge; and (3) to secure in the interests of national efficiency that all scientific and technical departments in the public service, and all industrial posts involving scientific knowledge, shall be under the direct control of persons having adequate scientific training and knowledge. Special objects deal with obtaining adequate endowment for research and advising as to the administration of such endowment, setting up an employment bureau and a register of trained scientific workers, and obtaining representation on the Whitley industrial councils. An applicant is qualified for membership if he or she has passed the examination leading to a university degree in science, technology, or mathematics, and is engaged at the time of application on work of a required standard, though certain other qualifications are regarded as equivalent to university degrees and admitted in lieu thereof. A resolution was carried unanimously that a special advisory committee should be appointed to deal with questions arising in connection with the promotion of research. At the close of the meeting the officers for the ensuing year were appointed as follows:—*President:* Dr. O. L. Brady (Woolwich). *Secretary:* Mr. H. M. Langton (miscellaneous). *Treasurer:* Mr. T. Smith (National Physical Laboratory). *Executive:* Mr. G. S. Baker, Dr. N. R. Campbell, Dr. C. C. Paterson (N.P.L.), Mr. R. Lobb, Mr. J. W. Whitaker (Woolwich), Dr. H. Jeffreys, Dr. F. Kidd (Cambridge), Dr. C. West (Imperial College), and Dr. A. A. Griffith (Royal Aircraft Establishment). The address of the secretary is Universal Oil Co., Kynochtown, Stanford-le-Hope, Essex.

The following is a list of those who have been recommended by the president and council of the Royal Society for election into the council for the ensuing year at the anniversary meeting on November 30:—*President:* Sir Joseph Thomson. *Treasurer:* Sir Alfred Kempe. *Secretaries:* Prof. Arthur Schuster and Mr. W. B. Hardy. *Foreign Secretary:* Prof. W. A. Herdman. *Other Members of the Council:* Sir George T. Beilby, Prof. V. H. Blackman, Mr. C. V. Boys, Sir James J. Dobbie, Sir Frank W. Dyson, Dr. M. O. Forster, Prof. F. W. Gamble, Dr. J. W. L. Glaisher, Sir Richard Glazebrook, Sir Alfred D. Hall, Sir William Leishman, Prof. W. J. Pope, Dr. W. H. R. Rivers, Prof. E. H. Starling, Mr. J. Swinburne, and Prof. W. W. Watts.

The court of assistants of the Salters' Company has appointed Dr. M. O. Forster, F.R.S., to be the first director of the Salters' Institute of Industrial Chemistry referred to in Nature of October 24. Since July, 1915, Dr. Forster has been chairman of the technical committee of British Dyes, Ltd., and was, until recently, a member of the board of directors.

In view of the urgent necessity for incurring certain preliminary expenditure for afforestation purposes, an interim authority has been set up to carry out the necessary work pending the passing of legislation setting up permanent machinery for the purpose. A supplementary estimate of the sum of 100,000*l*. has been made for this authority.

We regret to learn of the death at Utrecht, on October 21, of Prof. H. E. J. G. du Bois, well known to physicists by his numerous valuable contributions to the knowledge of magnetism and related subjects. Prof. du Bois was just beginning his work in the new Bosscha Laboratory which the Dutch Government had built for him at Utrecht.

The death of Mr. Edward Bennis is announced in the *Engineer* for November 8. Mr. Bennis was born in 1838, and was educated at the Quaker College of Newtown, in Waterford. He will be remembered for his inventions of mechanical stokers, and for his work in connection with problems of smoke abatement.

On Wednesday, November 20, the opening address of the 165th session of the Royal Society of Arts will be delivered by Mr. Alan A. Campbell Swinton, chairman of the council. The subject of the address will be "Science and the Future." The chair will be taken at 4.30.

At the students' meeting of the Institution of Electrical Engineers, to be held on Friday, November 22, at 7 p.m., at King's College, Strand, an address on "The Permeability of Faintly Magnetic Materials," illustrated by experiments, will be given by Prof. Ernest Wilson.

The following have been elected officers of the Cambridge Philosophical Society for the ensuing session 1918–19:—*President:* Mr. C. T. R. Wilson. *Vice-Presidents:* Dr. Doncaster, Mr. W. H. Mills, and Prof. Marr. *Treasurer:* Prof. Hobson. *Secretaries:* Mr. A. Wood, Mr. G. H. Hardy, and Mr. H. H. Brindley. *New Members of the Council:* Prof. Baker, Prof. Newall, and Dr. Fenton.

During the coming session the meetings of the British Association Geophysical Committee will be held on the third Tuesdays of November, January, February, March, May, and June at the Royal Astronomical Society. At the meeting on November 19, at 5 p.m., Mr. R. D. Oldham will open a discussion on "The Constitution of the Earth's Interior." The subjects to be dealt with at the January and later meetings will be seiches, seismology, terrestrial magnetism, geodesy, and atmospheric electricity.

At the anniversary meeting of the Mineralogical Society, held on November 5, the following officers and members of council were elected:—*President:* Sir William P. Beale, Bart. *Vice-Presidents:* Prof. H. L. Bowman and Mr. A. Hutchinson. *Treasurer:* Dr. J. W. Evans. *General Secretary:* Dr. G. T. Prior. *Foreign Secretary:* Prof. W. W. Watts. *Editor of the Journal:* Mr. L. J. Spencer. *Ordinary Members of Council:* Mr. H. Collingridge, Mr. T. Crook, Dr. G. F. Herbert Smith, Dr. H. H. Thomas, Mr. H. F. Collins, Mr. J. P. De Castro, Prof. H. Hilton, Lieut. A. Russell, Dr. A. Holmes, Miss M. W. Porter, Mr. R. H. Rastall, and Sir J. J. H. Teall.

The council of the Chemical Society has arranged for three lectures, bearing on the ultimate constitution of matter, to be delivered during the present session. The first lecture, entitled "The Conception of the Chemical Element as Enlarged by the Study of Radio-active Change," will be delivered by Prof. F. Soddy at the ordinary scientific meeting to be held at Burlington House on Thursday, December 19, at 8 p.m. Four informal meetings of the society will be held during the present session. The object of these meetings is to give fellows greater facilities for social intercourse than are afforded by the ordinary scientific meetings. The first will be held at Burlington House on Thursday, November 21, at 8 p.m., when the following exhibits will be on view:—Specimens illustrating the manufacture of saccharin (Boots Pure Drug Co., Ltd.), optical glass (Chance Bros. and Co., Ltd., and the Derby Crown Glass Co., Ltd.), tungsten products (Ediswan Electric Co., Ltd.), photographic chemicals (Ilford, Ltd.), fine chemicals (T. Morson and Son, Ltd.), and apparatus (Silica Syndicate, Ltd.).

We regret to record the death of Sir James William Restler on November 4. Sir James was born in 1851, and was chief engineer to the Metropolitan Water Board. From an account of his career which appears in *Engineering* for November 8, we learn that he completed his education at King's College, London, and received his professional training with the firm of Messrs. John Aird and Sons. In 1883, as chief engineer to the late Southwark and Vauxhall Water Co., he carried out works of considerable magnitude, including the construction of reservoirs having a capacity of 1,750,000,000 gallons, and filter-beds covering twenty-three acres. Sir James designed the Honor Oak reservoir, which was opened in 1909. He frequently gave technical evidence before Royal Commissions and at Parliamentary inquiries. He was a member of council of the Institution of Mechanical Engineers, and had been elected a member of council of the Institution of Civil Engineers for the current session.

Prof. G. Bruni, of the R. Istituto Tecnico Superiore, Milan, writes to suggest that now the Dardanelles are occupied by British and Allied forces, a monument to the memory of H. G. J. Moseley should be erected at the place where he died. "A call for a subscription to this end would be enthusiastically answered, not only in Great Britain, but also through all the Allied countries." While fully appreciating Prof. Bruni's suggestion, some of Moseley's friends are not much in favour of the erection of a monument at such a distant and inaccessible place. No doubt inclusive memorials will be erected by the various Governments to those who fell at the Dardanelles, and it would be a little invidious to pick out one of so many brave men for special recognition. What would be most suitable would be for the Royal Society or some other body to name a research scholarship in Moseley's honour, and it is to be hoped that ultimately something in this direction will be done. We understand that as soon as his friends on active service return to this country a Moseley memorial meeting will be held in the laboratory where he did his great research, with the view of erecting a tablet there, though this is not exactly the type of memorial which Prof. Bruni has in mind.

THE *Times* publishes an official report from Capt. Amundsen to the Norwegian Consul-General at Archangel, sent from Dickson Island by wireless telegraph on September 4. The *Maud* took a week to cross the Kara Sea, which in August was impeded with heavy ice, but Capt. Amundsen reports that, so far as he could judge, the ice conditions north of Siberia seem to be favourable. The beginning of September is rather late to pass Dickson Island, but Dr. F. Nansen, in an interview with the *Times* correspondent, expresses the hope that the expedition passed the New Siberia Islands early in November. In this case the ship should by now be beset in the pack and have begun her transpolar drift. Capt. Amundsen, however, has a difficult coast to navigate. He may quite possibly have been caught west of the Taimir Peninsula, and have had to seek winter quarters on the coast. The coast in the vicinity of the Nordenskjold Archipelago affords several suitable harbours. Nansen in August, 1893, and Vilkitski in September, 1914, had difficulties with ice in this region. Even if Cape Chelyuskin is safely rounded, heavy ice may possibly be found between that cape and the Lena delta—a region which has a bad reputation. Possibly in that case Capt. Amundsen will attempt to winter in the little-known Nicholas Land. The expedition reports having fifteen sledge-dogs on board, and to have loaded 105 barrels of oil at Dickson Island.

IN *Mind* (n.s., Nos. 107 and 108) W. M. Thorburn discusses the rights and wrongs of a person in language which is more vehement and impelling than is usual in philosophical papers. He contends that, in spite of the teaching of astronomers and biologists, men will persist in looking upon the "bimanous biped" as the apex of all creation, the highest possible evolutionary form, and, as a corollary, estimate the life of any man as of more intrinsic value than the life of any animal. The quantity and not the quality of the human species is too commonly taken as the ideal. The result is a maudlin sentimentality which fears to face the problem of retribution as the necessary result of wrong-doing, and a futile belief that, by an adjustment of environment, equality among men can be maintained—a belief which is disproved by all the analogies of Nature and the lessons of history. Science is the fruit of leisure, and men of science can have the necessary leisure only if others less gifted are prepared to undertake work which is often called menial. The author's conclusion is a plea to consider whither democracy is leading. The whole discussion is provocative and stimulating, supported by a wealth of literary and scientific allusion, and will be valuable to thinkers in many fields of activity from speculative philosophy to the most practical science. Many will disagree with his conclusions, but his point of view is one which ought to be realised and honestly faced.

IN the *Journal of Hellenic Studies* (vol. xxxviii., for 1918) Prof. Percy Gardner publishes an account of a valuable addition to the Ashmolean Museum in the shape of a female marble figure of great beauty, which lay unnoticed at Deepdene, and was purchased at the sale of the Hope collection in July last. It is not a mere portrait, but a portrait of a woman in the guise of deity, women in Greece being seldom honoured with a statue unless they were more or less deified. It dates from the period 460–440 B.C., corresponding with the active period of Pheidias, and there is good reason to believe that it is a portrait of Aspasia as Aphrodite, and it may account for the accusation of impiety which we know to have been brought against her. The article is fully illustrated by examples of the same type, and the Ashmolean Museum is to be congratulated on an acquisition of singular interest and value.

THE Sultanieh Geographical Society, Cairo, has recently published an attractive programme of its future operations. It proposes to undertake an ethnographic and geographical survey of Egypt, the results of which will be published in periodical bulletins and memoirs; to provide for lectures, a museum, and the conservation of archives connected with this work. The special subjects to which attention will be directed are a monographic survey of the Siva oasis, an outpost of Egypt which has been little studied; an examination of the three groups of Egyptian gipsies—the Beledi, Ghagar, and Nawar—of whom little is known; a study of irrigating devices, with comparison of ancient models; and basket-making. On these subjects monographs will be prepared, and documents, sketches, and photographs collected. The society is undertaking a valuable work which deserves the support of anthropologists.

THE *Indian Journal of Medical Research* for July (vol. vi., No. 1) contains an excellent summary by Lt.-Col. Clayton Lane on methods, old and new, for the detection of hook-worm (ankylostome) infection. Concentration of the ova of the parasite in the dejecta may be effected by straining and centrifuging, and also by a "levitation" method. In the latter the centrifuged deposit is placed on a slide in a little water and allowed to stand for five minutes. At the end of this time the slide is carefully immersed in water and then taken out. By this procedure particulate matter is largely removed, but the hook-worm ova are sticky and adhere to the slide. The exact technique is described, and the method is applicable for parasitic ova other than those of the hook-worm.

A BRIEF summary of the present position of the kelp industry appears in *California Fish and Game* (vol. iv., No. 3). In 1910 the Bureau of Soils of the United States proposed to exploit the vast beds of giant kelp, fringing much of the west coast of America, for the purpose of using these plants for the manufacture of potash and other fertilisers; and the scheme has proved a most fruitful one. The commonest of these plants is the ribbon-kelp (*Macrocystis pyrifera*), which forms enormous beds, usually in places where there is pronounced wave action. The beds of Macrocystis with which the Californian kelp industry is concerned extend from San Diego to Point Conception, and they have been divided up and rented to various companies, which last year harvested nearly 400,000 tons of kelp. It has been found necessary periodically to close the beds for recuperation after harvesting, and to regulate the time of cutting in order that the beaches should not be interfered with during the summer months, nor with unprotected beaches during the winter. From observations so far made, there is no evidence that the fishing industry is in any way injured by this removal of the terminal fronds of the weed, though adjustments are found to be necessary to prevent friction between kelp-harvesters and fishermen desiring to use the beds at the same time.

Attention may be directed to a paper on the anatomy of the potato plant, with special reference to the ontogeny of the vascular system, by E. F. Artschwager, published in vol. xiv., No. 6, of the *Journal of Agricultural Research*. The study was undertaken primarily to serve as a basis for work on that obscure disease—or group of diseases, possibly—to which the name "leaf-roll" has been given; and there can be no doubt that a serious scientific investigation of the nature and causes of this trouble is one of pressing importance for all countries where the potato is grown. The paper referred to will be found very useful as a convenient summary of previous work on the anatomy of the potato plant, and in some directions it throws new light on points which were formerly not altogether clear. The importance of the development of secondary phloëm is emphasised, and it is shown that the increase in size of the tuber is due more to the formation of new tissue in the perimedullary zone than to growth of the pith, as was formerly supposed. It is clearly shown that the skin of the tuber is composed of periderm derived to some extent from the original epidermis, as well as from the hypoderm. The paper is illustrated by twenty-one plates of excellent photomicrographs, as well as by a few text-figures.

In the Journal of the Washington Academy of Sciences for October 4 Messrs. P. D. Foote and T. R. Harrison, of the Bureau of Standards, in a paper on some peculiar thermo-electric effects, point out that the production of a thermo-electric current in a homogeneous wire by heating it unsymmetrically was known to Franklin and Cavendish a hundred and fifty years ago. It continues to be "rediscovered" once a decade, but up to the present time not one of the many causes which have been suggested for the effect has proved satisfactory. The authors state, however, that in the special form of the experiment in which a hot and a cold piece of the same metal are brought into contact, the direction of the current generated is connected with the sign of the Kelvin effect in the metal.

Mr. L. B. Atkinson gave the Kelvin lecture to the Institution of Electrical Engineers on November 7. He chose as his subject "The Dynamical Theory of Electric Engines," and began by quoting a formula for inductance or "electromagnetic capacity" which Kelvin gave in the 1860 edition of Nichol's "Cyclopædia" (see Thomson's "Reprint," p. 443). He suggested that this formula and the equally well known theorem for the mutual action between electric circuits when their currents are maintained constant had been overlooked by electricians, who merely considered what may be called the statical theory of the dynamo. Mr. Atkinson then developed an analogy between the cycle of an electromagnetic engine and the cycle of a reciprocating engine, deducing what appeared to us to be very curious formulæ for the efficiency of the various cycles. He excused his neglect of the resistance of the windings of the electric machines by pointing out that in the future some material of very small resistance may be discovered from which they can be made. Nothing was said either about hysteresis or armature reaction. In order that Kelvin's theorem might apply, Mr. Atkinson had to suppose that the currents in the coils were absolutely constant. Various triple integral formulæ well known to mathematicians were given for the energy stored up in the field, but we could not follow what use he made of them. It is difficult to see how the method developed can be of any practical use. It may be pointed out that the dynamical theory of the dynamo has been developed by Lyle, Russell, and several French electricians, who have based solutions on the conservation of energy and inductance formulæ on the lines laid down by Kelvin. Their results take cognisance of both resistance and armature reaction, and are in close agreement with experiment. As in all other theories, however, the assumption is made that the iron has constant permeability.

Among the books mentioned in the new announcement list of *Messrs. Longmans and Co.* we notice the following:—"Boiler Chemistry," J. H. Paul, with diagrams. "The Natural Organic Colouring Matters," Prof. A. G. Perkin and Dr. A. E. Everest; "Catalysis in Industrial Chemistry," Prof. G. G. Henderson; and "Plantation Rubber," G. S. Whitby (Monographs on Industrial Chemistry). "The Rare Earth Metals," Dr. J. F. Spencer, and a new edition of "Osmotic Pressure," Dr. A. Findlay (Monographs on Inorganic and Physical Chemistry). "Naval Architects' Data," J. Mitchell and E. L. Attwood; "Experimental Education," being a new and enlarged edition of "Introduction to Experimental Education," Dr. R. R. Rusk; and "Economic Reconstruction," J. Taylor Peddie.

The following additions will shortly be made to the series of "Military Medical Manuals," edited by Sir A. Keogh (*Hodder and Stoughton*):—"Commotions and Emotions of War," Prof. A. Léri, edited by Sir John Collie; "Disabilities of the Locomotor Apparatus, the Result of War Wounds," Prof. A. Broca, translated by Capt. J. R. White and edited by Sir Robert Jones; "Electro-diagnosis of the War," Prof. A. Zimmern and P. Perol, translated by L. P. Garrod and edited by E. P. Cumberbatch; "Mental Disorders of the War," Prof. J. Lépine, edited by Dr. C. A. Mercier; "Wounds of the Pleura and Lungs," Prof. R. Grégoire and Dr. A. Courcoux, edited by Lt.-Col. C. H. Fagge.

OUR ASTRONOMICAL COLUMN.

Borrelly's Comet.—This comet is now quite an easy object in a moderate telescope. Mr. R. L. Waterfield observed it at Cheltenham with a 4-in. refractor early in November. It was brighter than 9th magnitude with central condensation, but no stellar nucleus, diameter about 2′. The brightness will continue to increase throughout November, and the increasing north declination will facilitate observation.

Orbits of Two Spectroscopic Binaries.—Further interesting investigations of spectroscopic binaries are recorded in Bulletins Nos. 314 and 315 of the Lick Observatory. In the case of p Velorum, magnitude 4·1, Class F2, the spectra of both components are exhibited, and Dr. R. F. Sanford finds that the mass ratio is 1·23. Adopting Russell's average mass for F stars of three times that of the sun, the inclination of the orbit would be 27°. With this inclination the semi-major axes of the two orbits would be 10,880,000 km. and 13,340,000 km. respectively. The period is 10·210955 days, and the eccentricity 0·541. From some of the best spectrograms Messrs. Adams and Joy find the absolute visual magnitude to be +1·9 and the parallax 0·036″.

The star σ Scorpii, magnitude 3·1, class B1, has been investigated by Dr. F. Henroteau, whose value of 0·246834 day confirms previous conclusions as to the extreme shortness of the period. The semi-amplitude of each velocity curve has the constant value of 41·2 km. per second, but the velocity of the centre of mass is variable, as if a third body were present.